



Statement before the House Committee on the Budget

On

“America’s Infrastructure: Today’s Gaps, Tomorrow’s Opportunities,  
and the  
Need for Federal Investment”

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September 25, 2019

Chairman Yarmuth, Ranking Member Womack, distinguished Members of the Committee:

Thank you for the opportunity to submit testimony to the Budget Committee of the U.S. House of Representatives on the topic of America's infrastructure. I am R. Richard Geddes, Professor in the Department of Policy Analysis and Management at Cornell University, Founding Director of the Cornell Program in Infrastructure Policy, and Visiting Scholar at the American Enterprise Institute. I am a member of the Revenue and Finance Committee of the Transportation Research Board. I was also a member of the National Surface Transportation Policy and Revenue Study Commission, which reported its findings to Congress in 2008.

My testimony has five main points:

1. American faces challenges in both the *funding* and the *financing* of its infrastructure. Although those concepts are related, they should be distinguished and addressed separately. The *funding* of U.S. infrastructure is the most pressing concern.
2. Under its current structure, the Highway Trust Fund is not sustainable, for several reasons. The Fund, which has required several general fund bailouts, is projected to experience severe deficits in the future. Responsibility for infrastructure funding will, by default, devolve to the state and local governments that own most transportation infrastructure assets.
3. Absent new large federal revenues, the federal role should be to facilitate the enhanced funding, financing, and permitting of infrastructure by state and local asset owners. Infrastructure delivery can be facilitated by streamlining the National Environmental Policy Act (NEPA) process, for example.
4. New federal policies can assist state and local governments with infrastructure *funding*. Those include relaxing restrictions on tolling and mileage-based user fees as well as encouraging innovative policies such as value capture and asset recycling.
5. New federal policies can also assist state and local governments with infrastructure *financing*. Those include policies to encourage greater use of public-private partnerships, or PPPs. Policies include expanding the cap on, and use of, private activity bonds, as well as the creation of state and regional PPP units. Greater PPP use also provides enhanced investment opportunities for large investors such as public pension funds that do not find traditional tax-exempt investments as appealing.

I discuss each point below.

### **1. The Unsustainable Structure of the Highway Trust Fund**

There is widespread agreement that the United States is spending too little on its infrastructure. The Congressional Budget Office estimated that combined federal, state and local spending on infrastructure was (in current 2019 dollars) \$441 billion as of 2017. That was about 2.3 percent of U.S. GDP. It remains well below estimates of the spending needed to keep infrastructure in a state of good repair. The American Society of Civil Engineers estimates that

needs are about \$206 billion below expected actual spending for the 2016 to 2025 time period. The main extant tool for funding transportation infrastructure is gas and diesel taxes at both the state and federal level. The federal gas tax, for example, generates between 85 and 90 percent of the revenues flowing into the federal highway trust fund. Although that method provided stable funding for decades, there are several reasons why it has become a less reliable tool.

First, fossil fuel taxes naturally decline as motorists shift into alternative power sources, such as natural gas and electricity. Various policies, such as incentives to purchase electric vehicles, are encouraging that shift. Second, federal fuel taxes (and most state fuel taxes), are not indexed to inflation. The purchasing power of revenue from those taxes declines significantly over time even with modest inflation rates. The federal gas tax, which has not been changed since 1993, has lost about 40 percent of its purchasing power since that time.

Third, vehicle engines that do use fossil fuels are becoming more efficient. Corporate-average fuel economy (CAFÉ) standards encourage increased efficiency. That change however reduces revenue from taxes that depend on the use of fossil fuels.

Those factors are weighing on the Highway Trust Fund. Annual federal gas tax revenues are now about 15 billion less annually than at their 1999 peak. About \$140 billion in transfers from general funds have been required since 2008, further weakening the user-pays principle on which the Fund is based. The situation is likely to worsen over time. The Peter G. Peterson Foundation estimates that the Highway Trust Fund will face a cumulative shortfall of about \$192 billion between 2019 and 2028.

One obvious solution is to significantly increase federal gas and diesel taxes. That is unappealing from several policy perspectives, however. In addition to revenue instability, fuel taxes have become less equitable over time from both a horizontal and a vertical perspective. Horizontal equity refers to all those consuming a good or service at the same rate paying the same amount. This is a familiar concept, with those consuming electricity, natural gas, or water paying in proportion to their use. It is also the standard way that almost all goods and services are allocated. This approach is often referred to as a user fee or price.

Vertical equity, in contrast, refers to the notion that those with more resources should pay more for a good or service. That principle is reflected in progressive income taxation, for example.

Per-gallon fossil fuel taxes have become less equitable over time using both metrics. Those taxes were reasonably equitable from a horizontal perspective when they were increased in 1956 to fund construction of the Interstate Highway system. At that time, most vehicles of a certain size achieved similar gas mileage. That is, a Buick sedan, a Ford sedan, and a Mercury sedan achieved similar fuel efficiencies. Therefore, a driver of each type paid about the same per smile of road use.

That is no longer the case. Four-door sedans today can obtain wildly different gas mileages. An aging Chevrolet sedan may get very poor mileage (thus paying much in gas taxes per mile), while a new Tesla electric sedan effectively obtains infinite gas mileage (paying nothing in gas taxes per mile). Yet both use the same amount of road space. In sum, technology has reduced gas taxes' vertical equity. Although fuel taxes continue to raise revenue, they are no longer realistically viewed as true user fees.

Similarly, technology has eroded the horizontal equity characteristics of fuel taxes. Although wealthier drivers were never explicitly charged more, higher-income drivers today are more likely to drive all-electric or more fuel efficient vehicles. Conversely, poorer drivers are more likely to drive older, less fuel efficient vehicles, and keep them longer. Those forces have made fuel taxes more regressive over time. It is thus appropriate to explore other funding approaches.

## **2. Infrastructure Funding versus Infrastructure Financing**

It is important to consider carefully alternatives to the traditional fuel-tax approach to infrastructure funding. Before proceeding, infrastructure *funding* should be contrasted clearly with its *financing*. Funding refers to the underlying resources necessary to pay for infrastructure. Those dollars can come from one of three broad sources: (i) some type of rate, fee, or price tied closely to the use of a transportation facility. Examples include tolls and mileage-based user fees; (ii) some type of targeted tax related to use of the infrastructure generally. Tax-increment financing offers one example; and (iii) a broad-based tax that is unrelated to infrastructure use. Raising a state's sales tax to help pay for its transportation infrastructure, or using general fund revenue for infrastructure, offers two examples.

In contrast, *financing* refers to the use of financial tools to help generate the large upfront payments typically needed to design and construct new infrastructure, or renovate aging infrastructure. The United States is lucky to have many such tools at hand, including tax-exempt municipal bonds, taxable corporate bonds, equity investment, TIFIA loans, and state revolving funds, among others. Crucially, successful financing requires that reliable funding first be in place. If not, investment will not be forthcoming.

## **3. Addressing Asset Owners' Funding Challenges**

Given the decline of revenue into the federal Highway Trust Fund, funding responsibility has by default devolved to state and local infrastructure owners. The Interstate Highway system, for example, is largely owned by U.S. states. States are thus responsible for generating the resources necessary for its proper operation and maintenance, and expansion where necessary.

Recognizing this challenge, many states either have implemented or are exploring assorted new revenue sources. Those include raising state-level gas and diesel taxes, raising dedicated sales taxes, implementing mileage-based user fees, and increasing registration fees, or some mix of the above. Arkansas, for example, recently raised its gas tax by 3 cents per gallons, and its

diesel tax by 6 cents per gallon, which would raise about \$35 million per year transportation infrastructure. We are now experiencing a “laboratory of federalism” with respect to infrastructure funding methods.

The overall effect of those developments it is to alter fundamentally the federal role in infrastructure funding. This new reality needs to be recognized in federal policy. In the absence of considerable added federal revenue, that role should be to facilitate the ability of state and local governments to raise revenue on their own.

As I have argued elsewhere, the best solution from an economic perspective is network-wide, real time road pricing. That reflects the approach used in many other utilities, such as wholesale electricity pricing and radio-spectrum pricing. However, many political barriers would have to be addressed before it could be implemented for roads.

Barring such major changes, the appropriate federal role is to relax federal barriers to new state and local sources, and to help speed project delivery. Those changes can be viewed as facilitating state and local self-help. I next discuss several policy changes to facilitate that.

#### **4. Federal Policies to Facilitate Added State and Local Funding**

There are several ways in which federal policy can assist state and local governments in raising added revenue. Revenue-raising policies can be categorized broadly into user-fee approaches and value capture.

Although a full discussion is outside this testimony’s scope, an example helps illustrate increased use of user fees. Many new toll-financed projects are being developed by state and local public-sector agencies, which is a relatively new phenomenon. A primary example is the development of “managed lanes” projects, also known as express toll lanes (ETLs). The earliest version of such projects was the conversion of high-occupancy vehicle (HOV) lanes into high-occupancy or toll (HOT) lanes. Such conversions generate new revenue. Because many expressway corridors lacked HOV lanes that could be converted, however, state departments of transportation began exploring the installation of new tolled lanes via public-private partnerships, or concessions, that would be constructed and operated by a private partner. Examples include the I-495 ETLs on the Washington, DC Beltway in Northern Virginia, and the LBJ and NTE projects in the Dallas/Fort Worth area.

Such projects increase revenue, and thus capacity, without burdening governmental budgets. Federal policy can promote such projects through TIFIA loans, private activity bonds, and expediting environmental permitting, among others.

Still more compelling are the variety of ways federal policy can assist state and local governments in *value capture*. Value capture is the idea that there is tremendous value latent in much of American’s infrastructure, which can be released and captured via innovative policies. To offer just one example, there are hundreds of state-owned rest stops on the

Interstate Highway system that states are prevented by law (23 U.S. Code § 111) from developing. That explains why many motorists are dismayed by rest stops that are small and dark at night, offering only bathrooms, vending machines, and a few maps.

Section 111 of Title 23 could be reformed to permit states to develop those rest stops by offering concessions that allow the inclusion of shops and restaurants. States could realize that added value directly via concession fees. Those fees can be recycled directly back into the state's infrastructure.

Similarly, states can realize added value by optimizing real estate use. To again offer an example, state departments of transportation and municipalities may be able to capture added value by moving salt sheds, which occupy large land parcels, to lower-value locations. The public-sector owner captures the released value by leasing or selling the land previously occupied by the shed. Those new revenues can be dedicated to funding new and existing infrastructure.

The key policy question is how value capture should be incentivized. Because they have used traditional management methods for decades, state and local owners are unlikely to undertake extensive value capture programs without strong federal incentives. Federal policy can help in this regard via an *asset-recycling program*. I describe such a program below.

Asset recycling originated in 2014 in Australia as part of the government's Asset Recycling Initiative (ARI). Widely viewed as successful, the A\$3.3 billion ARI program incentivized roughly A\$23 billion in infrastructure investment. Australia offers the canonical model of how a successful recycling program can operate. Many definitions of asset recycling reflect the Australian experience. Transportation expert Robert Poole defines asset recycling as follows:

[A] state government leases (for 50 to 99 years) existing infrastructure assets (airports, seaports, toll roads, electric utilities, transmission grids, etc.) to investment funds and pension funds-and uses the proceeds for new, greenfield infrastructure. Thus, the asset value that is liberated from existing infrastructure is recycled into much-needed new infrastructure. The assets that are leased are ones with healthy user-fee revenue streams, while the projects into which the proceeds are invested are ones without such revenues: transit systems, schools, other public buildings, etc.

My definition of asset recycling embraces that approach, but goes further. In a broader asset recycling program, the first step is to inventory all infrastructure assets owned by a particular jurisdiction. Asset owners must know exactly what is under their control. Although this may seem obvious, many infrastructure owners are not fully aware of exactly what they own. In one notable example, after completing a thorough audit, New York City discovered it owned 1,100 vacant lots. Although the discoveries of other jurisdictions are unlikely to be as dramatic, they still stand to reap similar informational benefits from a comprehensive infrastructure audit.

The second step is to assess the approximate market value of those assets. This may require

enlisting the help of experts in the valuation of land, office buildings, parking lots and garages, and other types of infrastructure. A key step in properly managing any asset is to know its true value. This step is also important because the market value of many U.S. infrastructure assets is inherently challenging to assess. Transactions of infrastructure assets are rare, while values can change drastically over time.

The market valuation placed on those assets may surprise many owners. Such market information will not only help guide owners' decisions about proper management but may also give them stronger incentives to undertake proper operation and maintenance of those assets. Even if owners have firm estimates of infrastructure asset values, an external audit has substantial social value.

The third step is to use asset valuation information along with new management techniques to conduct a fresh, thorough analysis of the best way to manage infrastructure assets under a jurisdiction's control. Those improved management techniques should include all options rather than leases only. One is the long-term lease/no-lease PPP-based decision. Other options may include asset sales (e.g. sales of under-utilized parking lots, garages, office buildings, or other real estates), short- and long-term leases, concessions, in-kind asset transfers, and value capture, among other innovative approaches. The best option may also be to do nothing, implying that those assets are currently managed as efficiently as possible.

This step may require extensive objective, outside advice regarding the best mix of options to use in various circumstances. The set of optimal choices is likely to vary across jurisdictions depending on the type of infrastructure, the infrastructure's age, and a variety of other considerations. There is no "one size fits all" solution.

The fourth step is to quickly execute those key operational and managerial changes so as to realize value from all transactions undertaken. This process is likely to generate considerable revenue (e.g. from long-term lease payments or concessions), based on the Australian experience. In that case, the federal government provided a bonus to states for raising funds via asset recycling. A 15 percent bonus was sufficient for enticing Australian states to try this new approach. The United States should rely on a 15 percent bonus as the default unless there is a strong reason to change.

The final step is to determine the best use of the newly raised funds. This is the origin of the term "asset recycling." One common suggestion is to allocate those funds from revenue-generating infrastructure into non-revenue generating infrastructure, as noted above.

## **5. Federal Policies to Facilitate Improved State and Local Infrastructure Financing**

Although there are several, one important tool for enhancing state and local infrastructure financing is the public-private partnership, or PPP. PPPs are the key contractual vehicle for incorporating private investment into the provision and operation of transportation infrastructure. A PPP is subject to the standard rules of contracting, with clear performance

standards linked to readily observable metrics.

If properly implemented, such participation through greater PPP use helps address a set of problems that continue to plague America's transportation system. Social benefits of PPPs stem from five main qualities associated with increased private participation:

- (i) High-powered, focused incentives to innovate, to seek new revenue, and to better manage costs in a sector where high-powered incentives are socially beneficial
- (ii) Business acumen, knowledge, and experience sourced from a global market for infrastructure operators
- (iii) Additional capital and highly developed risk-bearing services through access to new debt and equity capital markets
- (iv) The utilization of a competitive contracting approach that enforces high-quality service and asset maintenance, and allows the discipline of competition to be harnessed for the public good
- (v) Large public investors, such as public pension funds, benefit from the long life cycles offered by equity investment in road, airport, and energy projects. The cash flows generated by those projects also correspond well with the funds' long-dated liabilities. More PPPs are needed to effectuate those investment opportunities.

There are many ways in which greater private participation through PPP concession leases will improve social welfare. Private partners contribute by bringing capital, risk-bearing services, focused incentives, and expertise to the management of existing transportation assets. Substantial investment in technology, upgrades, and renovation may be required, all of which can be supplied through a PPP.

PPPs must be done correctly however, to realize those social benefits. State and local asset owners often lack expertise in concluding and overseeing PPP agreements. Countries around the world have recognized that problem, and have created "PPP units" in response. PPP units are quasi-governmental entities that assist the public sector with pre-project screening, project prioritization, education, and expert advice. PPP units have been established in Australia, Canada, China, Israel, Japan, Egypt, the United Kingdom, and India, among many other countries. They strive to ensure that infrastructure projects attract private participation while promoting the public interest.

PPP units have effectively supported private participation in infrastructure around the world. Because the US lags behind other developed countries in PPP use, the benefits of such units would likely be large if implemented here. Federal infrastructure policy should encourage the creation of state and regional PPP units here.<sup>1</sup>

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<sup>1</sup> See Carter B. Casady and R. Richard Geddes, *Private Investment in U.S. Infrastructure: The Role of PPP Units*, Washington, DC: AEI Press, (October 2016), for more details.

Aside from creating PPP units, there are several ways in which federal policy can enhance state and local use of PPPs. Perhaps the most important is to create a “level playing field” for the tax treatment of PPP debt. Although highways and transit PPPs have access to tax-exempt private activity bonds (or PABs, which level the field with tax-exempt municipal debt), those bonds face a \$15 billion cap. Many analysts view that cap as overly constraining. It should be lifted or eliminated.

Second, the PPP approach should be encouraged via PABs for all public-purpose infrastructure, including seaports, airports, air-traffic control, water and wastewater treatment, and inland waterways, among many others. Similarly, policies should be adopted to encourage PPPs for both greenfield and brownfield projects.

## **6. Streamlining Environmental Permitting**

The NEPA process is major concern impacting virtually all types of transportation infrastructure. There is widespread agreement that the process requires reform. For example, a highway project may require 10 different federal agencies considering 16 separate permitting decisions to obtain approval. State and local governments often have their own permitting requirements.

That process often leads to delays. Our analysis of data on 1,269 projects indicates that the time from Notice of Intent (or NOI, the formal announcement of intent to prepare an Environmental Impact Statement, or EIS) to Record of Decision (or ROD, the official recording of a Federal agency's decision concerning the proposed action) has increased from about 4 years in 2010 to over 5 presently. Over 7 percent of the projects in our data set were delayed for more than 10 years. Two projects were even delayed for more than 20 years.

One important reform is the adoption of the “One Federal Decision” approach. That approach would establish a lead agency to administer a single EIS and a single ROD. It would ensure that permitting processes were conducted concurrently rather than sequentially. It would also establish a goal of two years after the publication of the NOI for the completion of the environmental review process. Such an approach would help reduce the substantial uncertainties (and thus costs) currently surrounding NEPA project approvals.